University of the State of New York

Examination Department

147TH EXAMINATION

ADVANCED ALGEBRA

August 1897 — Three hours, only

---

100 *credits, necessary to pass,* 75

Answer 10 questions but no more. If more than 10 are answered only the first 10 answers will be considered. Division of groups is not allowed. Give each step of solution. Reduce fractions to lowest terms. Express final result in its simplest form and mark it Ans. Each complete answer will receive 10 credits.

1 Define *logarithm, undetermined coefficient, converging series, rationalization, permutation.* Give illustration of each.

2–3 Derive the formula for the combinations (selections) of n things taken r at a time.

4 Solve $x^4 - 12x^3 + 34x^2 + 12x = 35$

5–6 The area of a rectangle is 1200 square feet; if one of its dimensions is increased 3 feet and the other is decreased $1\frac{1}{2}$ feet, the area will be increased 60 square feet. Find the dimensions of the rectangle. Interpret the negative result.

7 Expand $\sqrt{a-x}$ to four terms, using the method of undetermined coefficients.

8 Find by the use of continued fractions three approximate values of 3.141592. Which of these values are too large? which too small?

9–10 Derive the formula for finding the sum of a recurring series of the second order.

11 Given $\log 8 = .9030$ and $\log 9 = .9542$; find (*a*) $\log 4$, (*b*) $\log 6$, (*c*) $\log 15$, (*d*) $\log .04$, (*e*) $\log 400$.

12–13 Find the integral part of each root of the equation $x^3 - 6x^2 + 3x + 9 = 0$. State the principle applied.

14 Expand to four terms by the binomial formula $(a+b)^{-\frac{3}{2}}$

15 Form the equation whose roots are less by 3 than those of the equation: $x^4 + 9x^3 + 12x^2 - 144 = 0$